

CLAIMS

What is claimed is:

1. A method of monitoring and controlling message delivery from a remote node comprising:
 - 5 establishing a connection with a remote node;
 - detecting when an incoming message is received from a remote node;
 - determining a timeout corresponding to the time at which an acknowledgment message is expected by the remote node in response to the incoming message; and
 - 10 sending a suppression message to the remote node if the acknowledgment message has not been sent to the remote node before the timeout expires, wherein the incoming message, the acknowledgment message, and the suppression message are all transmitted on the connection.
2. The method of claim 1 wherein the suppression message suspends messages from being sent by the remote node.
3. The method of claim 2 further comprising sending a resume message to the remote node.
4. The method of claim 3 wherein the resume message is sent when the acknowledgment message is sent.
- 20 5. The method of claim 3 wherein the resume message is the acknowledgment message.

6. The method of claim 1 further comprising forwarding the incoming message over a wireless link to a user.
7. The method of claim 6 further comprising receiving the acknowledgment from the user via the wireless link.
- 5 8. The method of claim 6 further comprising sending the suppression message immediately if we determine that the wireless link was lost.
9. The method of claim 1 wherein determining further comprises determining a round-trip time.
- 10 10. The method of claim 9 wherein determining further comprises setting a timer in a timer table.
11. The method of claim 1 wherein sending the suppression message further comprises generating a message segment.
12. The method of claim 11 wherein generating the message segment comprises generating according to a predetermined protocol.
- 15 13. The method of claim 12 wherein the predetermined protocol is TCP/IP.
14. The method of claim 13 wherein the suppression message is indicative of an advertised window of zero.
15. The method of claim 1 wherein the detecting and the sending do not require modification of a TCP/IP stack at the user.
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16. The method of claim 1 wherein the determining and detecting occur by reading a transport layer segment from a network layer.
17. A system for monitoring and controlling message delivery from a remote node comprising:
- 5 a wireless gateway operable to detect when an incoming message is received from a remote node over a point to point connection;
- a timer manager in the wireless gateway operable to determine a timeout corresponding to the time at which an acknowledgment message is expected by the remote node in response to the incoming message;
- 10 a segment generator in the wireless gateway responsive to the timeout and operable to generate and send a suppression message to the remote node if the acknowledgment message has not been sent to the remote node before the timeout expires, wherein the incoming message, the acknowledgment message, and the suppression message are all adapted to be transmitted on the point-to-
- 15 point connection.
18. The system of claim 17 wherein the suppression message is operable to suspend messages from being sent by the remote node.
19. The system of claim 18 wherein the segment generator is further operable to generate and send a resume message to the remote node, wherein the resume
- 20 message is operable to allow messages to be sent by the remote node.
20. The system of claim 19 wherein the segment generator is operable to send the resume message when the acknowledgment message is sent.
21. The system of claim 19 wherein the resume message is the acknowledgment message.

22. The system of claim 17 wherein the wireless gateway is operable to forward the incoming message over a wireless link to a user.
23. The system of claim 22 wherein the wireless gateway is further operable to receive the acknowledgment from the user via the wireless link.
- 5 24. The system of claim 22 wherein the wireless gateway further comprises a link detector operable to determine if the wireless link is lost.
25. The system of claim 24 wherein the link detector is further operable to direct the segment generator to send the suppression message immediately if the link detector detects that the wireless link is lost.
- 10 26. The system of claim 17 wherein the timer manager is further operable to determine a round-trip time.
27. The system of claim 26 wherein the timer manages is further operable to set a timer corresponding to the round-trip time in a timer table.
28. The system of claim 17 wherein sending the suppression message further
15 comprises generating a message segment.
29. The system of claim 28 wherein the segment generator generates the message segment according to a predetermined protocol.
30. The system of claim 29 wherein the predetermined protocol is TCP/IP.
31. The system of claim 30 wherein the suppression message is indicative of an
20 advertised window of zero.

32. The system of claim 30 wherein the TCP/IP stack corresponding to the remote node is not modified by the wireless gateway.
33. The system of claim 17 wherein the timer manager is operable to read a network layer segment from a transport layer.
- 5 34. A computer program product including computer program code for monitoring and controlling message delivery from a remote node comprising:
- computer program code for establishing a point-to-point connection with a remote node;
 - 10 computer program code for detecting when an incoming message is received from a remote node;
 - computer program code for determining a timeout corresponding to the time at which an acknowledgment message is expected by the remote node in response to the incoming message; and
 - 15 computer program code for sending a suppression message to the remote node if the acknowledgment message has not been sent to the remote node before the timeout expires, wherein the incoming message, the acknowledgment message, and the suppression message are all transmitted on the connection.
35. A computer data signal for monitoring and controlling message delivery from a remote node comprising:
- 20 program code for establishing a point-to-point connection with a remote node;
 - program code for detecting when an incoming message is received from a remote node;
 - 25 program code for determining a timeout corresponding to the time at which an acknowledgment message is expected by the remote node in response to the incoming message; and

program code for sending a suppression message to the remote node if the acknowledgment message has not been sent to the remote node before the timeout expires, wherein the incoming message, the acknowledgment message, and the suppression message are all transmitted on the connection.

- 5 36. A system for monitoring and controlling message delivery from a remote node comprising:

means for establishing a point-to-point connection with a remote node;

means for detecting when an incoming message is received from a remote node;

- 10 means for determining a timeout corresponding to the time at which an acknowledgment message is expected by the remote node in response to the incoming message; and

- means for sending a suppression message to the remote node if the acknowledgment message has not been sent to the remote node before the
15 timeout expires, wherein the incoming message, the acknowledgment message, and the suppression message are all transmitted on the connection.